

IN THE CLAIMS

1. (Previously Presented) A method of summarizing digital audio data comprising the steps of:

directly analyzing the audio data to identify a representation of the audio data having at least one calculated feature characteristic of the audio data;

classifying the audio data on the basis of the representation into a category selected from at least two categories; and

generating an acoustic signal representative of a summarization of the digital audio data, wherein the summarization is dependent on the selected category.

2. (Previously Presented) A method as claimed in claim 1, wherein the analyzing step further comprises segmenting audio data into segment frames, and overlapping the frames.

3. (Previously Presented) A method as claimed in claim 2, wherein the classifying step further comprises classifying the frames into a category by collecting training data from each frame and determining classification parameters by using a training calculation.

4. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the calculated feature comprises perceptual and subjective features related to music content.

5. (Previously Presented) A method as claimed in claim 3, wherein the training calculation comprises a statistical learning algorithm wherein the statistical learning algorithm is Hidden Markov Model, Neural Network, or Support Vector Machine.

6. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the type of acoustic signal is music.

7. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the type of acoustic signal is vocal music or pure music.

8. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the calculated feature is amplitude envelope, power spectrum or mel-frequency cepstral coefficients.

9. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the summarization is generated in terms of clustered results and heuristic rules related to pure or vocal music.

10. (Currently Amended) A method as claimed in ~~any preceding claim~~ claims 1, wherein the calculated feature relates to pure or vocal music content and is linear prediction coefficients, zero crossing rates, or mel-frequency cepstral coefficients.

11. (Previously Presented) An apparatus for summarizing digital audio data comprising:

a feature extractor for receiving audio data and directly analyzing the audio data to identify a representation of the audio data having at least one calculated feature characteristic of the audio data;

a classifier in communication with the feature extractor for classifying the audio data on the basis of the representation received from the feature extractor into a category selected from at least two categories; and

a summarizer in communication with the classifier for generating an acoustic signal representative of a summarization of the digital audio data, wherein the summarization is dependent on the category selected by the classifier.

12. (Previously Presented) An apparatus as claimed in claim 11, further comprising a segmentor in communication with the feature extractor for receiving an audio file and segmenting audio data into segment frames, and overlapping the frames for the feature extractor.

13. (Previously Presented) An apparatus as claimed in claim 12, further comprising a classification parameter generator in communication with the classifier, wherein the classifier classifies each of the frames into a category by collecting training data from each frame and determining classification parameters by using a training calculation in the classification parameter generator.

14. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 -13, wherein the calculated feature comprises perceptual and subjective features related to music content.

15. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 -14, wherein the training calculation comprises a statistical learning algorithm wherein the statistical learning algorithm is Hidden Markov Model, Neural Network, or Support Vector Machine.

16. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 -15, wherein the acoustic signal is music.

17. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 =16, wherein the acoustic signal is vocal music or pure music.

18. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 =17, wherein the calculated feature is amplitude envelope, power spectrum or mel-frequency cepstral coefficients.

19. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 =18, wherein the summarizer generates the summarization in terms of clustered results and heuristic rules related to pure or vocal music.

20. (Currently Amended) An apparatus as claimed in ~~any of claims~~ claim 11 =19, wherein the calculated feature relates to pure or vocal music content and is linear prediction coefficients, zero crossing rates, or mel-frequency.

21. (Previously Presented) A computer program product for summarizing digital audio data comprising a computer usable medium having computer readable program code means embodied in said medium for causing the summarizing of digital audio data, said computer program product comprising:

a computer readable program code means for directly analyzing the audio data to identify a representation of the audio data having at least one calculated feature characteristic of the audio data;

a computer readable program code for classifying the audio data on the basis of the representation into a category selected from at least two categories; and

a computer readable program code for generating an acoustic signal representative of a summarization of the digital audio data, wherein the summarization is dependent on the selected category.

22. (Previously Presented) A computer program product as claimed in claim 21, wherein analyzing further comprises segmenting audio data into segment frames, and overlapping the frames.

23. (Previously Presented) A computer program product as claimed in claim 22, wherein classifying further comprises classifying the frames into a category by collecting training data from each frame and determining classification parameters by using a training calculation.

24. (Currently Amended) A computer program product as claimed in ~~any of claims claim~~ 21 ~~=23~~, wherein the calculated feature comprises perceptual and subjective features related to music content.

25. (Currently Amended) A computer program product as claimed in ~~any of claims claim~~ 21 ~~=24~~, wherein the training calculation comprises a statistical learning algorithm wherein the statistical learning algorithm is Hidden Markov Model, Neural Network, or Support Vector Machine.

26. (Currently Amended) A computer program product as claimed in ~~any of claims claim~~ 21 ~~=25~~, wherein the acoustic signal is music.

27. (Currently Amended) A computer program product as claimed in ~~any of claims claim~~

21 =26, wherein the type of acoustic signal is vocal music or pure music.

28. (Currently Amended) A computer program product as claimed in ~~any of claims~~ claim

21 =27, wherein the calculated feature is amplitude envelope, power spectrum or mel-frequency cepstral coefficients.

29. (Currently Amended) A computer program product as claimed in ~~any of claims~~ claim

21 =28, wherein the summarization is generated in terms of clustered results and heuristic rules related to pure or vocal music.

30. (Currently Amended) A computer program product as claimed in ~~any of claims~~ claim

21 =29, wherein the calculated feature relates to pure or vocal music content and is linear prediction coefficients, zero crossing rates, or mel-frequency.